

# इंटरनेट

# मानक

## Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 5475-4 (1985): Fixed Polystyrene Film Dielectric Capacitors, Part 4: Type FCPS-3 [LITD 5: Semiconductor and Other Electronic Components and Devices]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE





Indian Standard

# SPECIFICATION FOR FIXED POLYSTYRENE FILM DIELECTRIC CAPACITORS

## PART 4 TYPE FCPS-3

**0. General** — This standard ( Part 4 ) shall be read in conjunction with IS: 5475 ( Part 1 ) 1978 'Specification for polystyrene film dielectric capacitors: Part 1 General requirements and methods of test ( first revision )'.

**1. Scope** — This standard covers general purpose fixed polystyrene film dielectric capacitors, buried foil type, tubular, axial lead, open type.

**2. Outline, Drawing and Dimensions** — The outline, drawing and dimensions shall be according to Fig. 1 and Table 1.

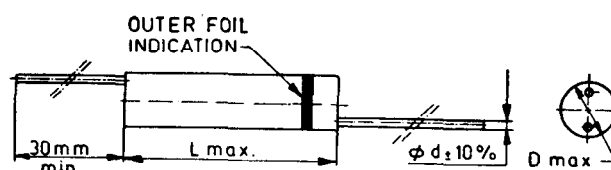


FIG. 1 OUTLINE, DRAWING AND DIMENSIONS

**3. Ratings** — The ratings shall be as specified in Table 1.

### 4. Characteristics

- |                            |   |
|----------------------------|---|
| a) Selection tolerance     | 2, 5 and 10 percent                       |
| b) Stability class         | 3 percent                                 |
| c) Temperature coefficient | — 150 ppm/°C ± 50 ppm/°C                  |
| d) Vibration               | 10-500 Hz, 100 m/s <sup>2</sup> , 3 × 2 h |
| e) Bump                    | 1 000 bumps, 100 m/s <sup>2</sup>         |
| f) Climatic category       | 10/70/04                                  |

[ Category 3 of IS : 5475 ( Part 1 )-1978 ]

TABLE 1 DIMENSIONS AND RATINGS

Capacitance Value in pF	100 V DC			250 V DC			630 V DC		
	D	L	d	D	L	d	D	L	d
	Max (2)	Max (3)	± 10 % (4)	Max (5)	Max (6)	± 10 % (7)	Max (8)	Max (9)	± 10 % (10)
(1)									
10	4.5	12	0.4	4.5	12	0.4	4.5	12	0.4
22	4.5	12	0.4	4.5	12	0.4	4.5	12	0.4
47	5.0	12	0.4	5.0	12	0.4	5.0	12	0.4
68	5.0	12	0.4	5.0	12	0.4	5.0	12	0.4
100	5.0	12	0.4	5.0	12	0.4	5.5	12	0.4
150	5.0	12	0.4	5.0	12	0.4	6.0	12	0.4
220	5.0	12	0.4	5.5	12	0.4	6.5	12	0.4
330	5.5	12	0.4	6.0	12	0.4	6.5	12	0.4
470	5.5	12	0.4	6.0	12	0.4	7.0	12	0.4
680	6.0	12	0.4	6.5	12	0.4	6.5	17	0.5
1 000	6.0	12	0.4	6.5	12	0.4	7.5	17	0.5
2 200	7.0	12	0.4	6.5	17	0.5	9.0	17	0.5
3 300	7.0	17	0.5	7.5	17	0.5	10.0	22	0.5
4 700	7.5	17	0.5	8.5	17	0.5	11.0	22	0.5
6 800	9.0	17	0.5	8.5	22	0.5	13.0	22	0.5
10 000	9.0	22	0.5	10.5	22	0.5	12.0	32	0.5
22 000	12.0	22	0.5	11.0	32	0.5	14.0	32	0.5
33 000	11.0	32	0.5	14.0	32	0.5	16.0	32	0.5
47 000	12.5	32	0.5	15.0	32	0.5	—	—	—
68 000	15.0	32	0.5	17.0	32	0.5	—	—	—
100 000	17.0	32	0.5	19.0	32	0.5	—	—	—

Adopted 28 October 1985

© April 1986, ISI

Gr 2

# IS : 5475 ( Part 4 ) - 1985

5. Marking — See 7 of IS : 5475 ( Part 1 )-1978.

6. Material Construction and Workmanship — See 5 of IS : 5475 ( Part 1 )-1978.

7. Classification of Tests — See 8.1 of IS : 5475 ( Part 1 )-1978.

7.1 General Conditions of Tests — See 8.2 of IS : 5475 ( Part 1 )-1978. The same measuring set shall be used for any one test but not necessarily for all the tests.

7.2 Schedule of Type Tests — The test schedule and the requirements shall be in accordance with Table 2.

TABLE 2 TEST SCHEDULE AND REQUIREMENTS

SI No.	Test	Clause Ref in IS : 5475 ( Part 1 )-1978	Condition of Test	Requirements
( 1 )	( 2 )	( 3 )	( 4 )	( 5 )
I) Group 0				
a)	Visual examination	8.4.1	—	The condition, workmanship and the finish shall be satisfactory. Marking shall be legible
b)	Dimensions	8.4.2	—	The dimensions of the capacitors and their terminations shall be in accordance with Table 1 read with Fig. 1
c)	Capacitance	8.3.2	—	The capacitance value shall correspond with the rated capacitance value taking into account the tolerances
d)	Tangent of the loss angle	8.3.3	—	Tan $\delta$ shall not exceed 0.001 at 1 MHz or 100 kHz for values less than 1 000 pF, and 0.001 at 1 kHz or 10 kHz for values $\geq$ 1 000 pF
e)	Insulation resistance	8.3.4	—	i) Between terminations: For $C \leq 0.1 \mu F$ — shall be greater than 100 000 M $\Omega$ For $C > 0.1 \mu F$ — shall be greater than 10 000 M $\Omega$ ii) Between body and terminations together. The insulation resistance shall be greater than 10 000 M $\Omega$
f)	Voltage proof	8.3.1	Between terminations — 2.5 times the rated voltage ( dc ) shall be applied Between terminations shorted and the body — 2.5 kV dc shall be applied	There shall be no breakdown, spark or flashover
g)	Outer foil marking	8.3.7	—	As specified in Part 1
II) Group 1				
a)	Solderability	8.4.4.1	—	The terminations shall wet easily and the tinning shall be uniform and good
b)	Robustness of terminations	8.4.3	—	There shall be no visible damage
1)	Visual examination	8.4.1	—	There shall be no visible damage
2)	Capacitance	8.3.2	—	As in Group 0
3)	Tangent of loss angle	8.3.3	—	As in Group 0
4)	Insulation resistance	8.3.4	—	As in Group 0

( Continued )

TABLE 2 TEST SCHEDULE AND REQUIREMENTS — *Contd*

SI No.	Test	Clause Ref in IS : 5475 ( Part 1 )-1978	Condition of Test	Requirements
( 1 )	( 2 )	( 3 )	( 4 )	( 5 )
	c) Bump	8.4.6	1 000 Bumps, 100 m/s <sup>2</sup> . For 50 percent of the samples, the rated voltage shall be applied	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance from the initial value shall not exceed $\pm 3$ percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
	d) Vibration	8.4.5	10-500 Hz, 100 m/s <sup>2</sup> , 6 h. For 50 percent of the samples, the rated voltage shall be applied	
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance from the initial value shall not exceed $\pm 3$ percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
	e) Rapid change of temperature	8.5.3	—	
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance from the initial value shall not exceed $\pm 3$ percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	f) Climatic sequence	8.5.1	—	
	1) Dry heat	8.5.1.2	At maximum upper category temperature	
	i) Insulation resistance ( hot )	8.3.4	—	Between terminations — 1 800 M $\Omega$ for C > 0.1 $\mu$ F and 18 000 M $\Omega$ for C $\leq$ 0.1 $\mu$ F between body and terminations — 18 000 M $\Omega$ Min
	ii) Capacitance	8.3.2	To be measured within two hours of removal from chamber	The change in capacitance value from the initial value shall not exceed $\pm 3$ percent
	2) Damp heat ( accelerated ) first cycle	8.5.1.3	1 cycle	
	3) Cold	8.5.1.4	At minimum category temperature	
	Final measurements			
	i) Visual examination	8.4.1	—	There shall be no damage
	ii) Capacitance	8.3.2	—	The change in capacitance from the initial value shall not exceed $\pm 3$ percent
	iii) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 0.002
	iv) Insulation resistance	8.3.4	—	Not less than 20 percent of the value in Group 0
III) Group 2				
	Damp heat ( long term )	8.5.2	—	
	a) Voltage proof test	8.3.1	—	There shall be no breakdown spark or flash over

( Continued )

TABLE 2 TEST SCHEDULE AND REQUIREMENTS — *Contd*

Sl No.	Test	Clause Ref in IS : 5475 ( Part 1 )-1978	Condition of Test	Requirements
( 1 )	( 2 )	( 3 )	( 4 )	( 5 )
	b) Visual examination	8.4.1	—	There shall be no damage
	c) Capacitance	8.3.2	—	The change in capacitance from the initial value shall not exceed $\pm 3$ percent
	d) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 0.002
	e) Insulation resistance	8.3.4	—	Not less than 20 percent of the value in Group 0
IV) Group 3				
	Endurance test	9.2	1 000 hours	
	a) Visual examination	8.4.1	—	There shall be no damage
	b) Capacitance	8.3.2	—	Change in capacitance value shall not exceed $\pm 1$ percent
	c) Tangent of loss angle	8.3.3	—	As in Group 0
	d) Insulation resistance	8.3.4	—	As in Group 0
V) Group 4				
	Temperature coefficient and capacitance drift	8.3.5	—	Temperature coefficient shall be within the limits of $-150 \text{ ppm} \pm 50 \text{ ppm}/^{\circ}\text{C}$ and $\Delta C$ shall be less than $\pm 1.5$ percent